



ARISTOTLE UNIVERSITY OF THESSALONIKI
FACULTY OF HEALTH SCIENCES
SCHOOL OF PHARMACY
DEPARTMENT OF PHARMACOGNOSY-PHARMACOLOGY
LABORATORY OF PHARMACOGNOSY
541 24 THESSALONIKI

Diamanto Lazari, Associate Professor
Tel.: 0030 2310-997617, Fax: 0030 2310-997662, Mobile: 0030 6977014405
e-mail: dlazari@pharm.auth.gr

Thessaloniki, February 6th 2017

Chemical analysis of essential oils of cultivated Oregano

Essential oil analysis

Essential oil analyses were performed on a Shimadzu GC-2010-GCMS-QP2010 system operating at 70 eV. This was equipped with a split/splitless injector (230 °C) and a fused silica HP-5 MS capillary column (30 m x 0.25 mm i.d., film thickness 0.25 μm). The temperature program was executed from 50 °C to 290 °C, at a rate of 4 °C min⁻¹. Helium was used as a carrier gas at a flow rate of 1.0 mL min⁻¹. The injection volume of each sample was 1 μL. Retention indices for all compounds were determined according to literature (Van den Dool and Kratz, 1963), using n-alkanes as standards. Compound identification was based on comparison of their mass spectra with those of NIST21 and NIST107 (Massada, 1976), and comparison of their retention indices with literature data (Adams, 2007). Essential oils were often subjected to co-chromatography with authentic compounds (Fluka, Sigma).

Bibliography

- H. Van den Dool, P. D. Kratz, *J. Chromatogr.*, 11, (1963), 463-471.
Y. Massada, *Analysis of essential oil by gas chromatography and spectrometry*; John Wiley & Sons: New York, 1976.
R. P. Adams, *Identification of Essential Oil Components by Gas Chromatography/Mass Spectroscopy*, Allured Publishing: Illinois, 2007.

Chemical analysis (%) of essential oils of cultivated Oregano

IDENTIFICATION ^a	FRESH 2 YEARS	DRY 2 YEARS
α -Thujene	1.45	1.17
α -Pinene	0.73	0.71
Camphene	0.27	0.26
β -Pinene	0.20	0.15
Myrcene	1.81	1.53
α -Phellandrene	0.21	0.22
δ -3-Carene	0.08	0.07
α -Terpinene	0.89	0.93
p-Cymene	7.71	7.97
γ -Terpinene	3.83	3.47
<i>cis</i> -Sabinenehydrate	0.39	0.23
Terpinolene	0.06	0.09
<i>trans</i> -Sabinenehydrate	0.10	0.05
Borneol	0.57	0.51
Terpinen-4-ol	0.69	0.60
α -Terpineol	0.09	0.09
<i>trans</i> -Dihydrocarvone	0.14	0.15
Thymol	0.49	0.96
Carvacrol	76.20	77.00
β -Bourbonene	Tr	Tr
β -Caryophyllene	1.03	0.97
α -Humulene	0.15	0.14
Germacrene D	Tr	Tr
β -Bisabolene	2.60	2.47

^a Compounds listed in order of elution from an HP-5 MS capillary column; Tr: traces (≤ 0.05)

Please feel free to contact me if you have any questions.

Sincerely,

A handwritten signature in blue ink, appearing to be 'Lazari Diamanto', with a stylized, cursive script.

Lazari Diamanto, PhD